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USSR Report

CONSTRUCTION AND EQUIPMENT

No. 28



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CONSTRUCTION

MINISTER DESCRIBES ACHIEVEMENTS, SHORTCOMINGS OF BELORUSSIAN CONSTRUCTION INDUSTRY

Minsk KOMMUNIST BELORUSSII in Russian No 10, Oct 80 pp 32-38

/Article by I. Mozolyako, minister of industrial construction, Belorussian SSR:
"The Alliance Between Builders and Science"/

/Text/ The "Basic Directions for the Development of the USSR's National Economy, 1976-1980" contain the following directive: Accelerate the transition to planning and evaluating the activities of construction organizations on the basis of projects that have been completed and turned over to the customer and complexes under construction that are ready to start production and offer services. Our ministry was the first in the country to start implementing this Party directive. It required, of course, new organizational and technical and economic decisions. Initially, one very important -- if not the most important -- factor was the thorough and comprehensive substantiation of ways of improving construction production under the conditions of this economic experiment. We understood that without the extensive introduction of scientific achievements we could not manage to do it, so we began to be more active in strengthening our creative relationships with scientific research organizations, thereby creating with them a unified front searching for rational methods for solving urgent problems. Our ministry formed one such front with USSR Gosstroy's Scientific Research Institute of the Economics of Construction (NIIES) and USSR Minpromstroy's /Ministry of Industrial Construction/ Giproftestroy scientific research institute. This, we say frankly, is producing tangible results.

In working according to the new principle, from the very first there arose serious difficulties in planning activity according to the indicator of commodity production. Scientists and our own specialists jointly found successful solutions to these problems, which were far from easy. In a comparatively short period of time, they were able to develop methodological documentation to provide for planning and the calculation of economic indicators under the conditions of the new system of administration. First of all, this contributed to the overcoming of a psychological barrier on the part of builders who had long been accustomed to planning and recording the results of their activity by "volume." Now, when the main indicator had become finished output, it was necessary to find a fundamentally new approach to the prospective planning of construction production. This required the preparation of methodological recommendations for norm setting, planning and the analysis of incomplete construction. In other words, we received a scientifically substantiated base for the organization of continuous planning. The work that was done yielded tangible results. Because of the increased concentration of construction

work and the reduction in the number of projects under construction at the same time, during the experiment there was a significant reduction in the amount of time it took to finish projects and put them into operation. Thus, favorable conditions were created for improving working conditions and production standards, changing over to the flow-line method of organizing construction work, and improving the quality of the work.

A substantial contribution to the development and comprehensiveness of the experiment we conducted was made by specialists from USSR Minpromstroy's Design and Engineering Institute, the Belorussian SSR Minpromstroy, the Belorussian Polytechnical Institute's Scientific Research Laboratory of the Organization and Economics of Construction, and other organizations throughout the republic and the country.

A great deal of help is being given us by the collective of the Belorussian branch of USSR Gosstroy's All-Union Scientific Research and Planning Institute of Labor in Construction (VNIPITS). It is a well known fact that the reduction in the rate of labor productivity growth in our branch is the result of a number of unsolved technical and organizational problems. Although the former are, as a rule, beyond the limits of competence of construction subunits and even ministries, the organizational problems are of a strictly internal nature. Actually, a considerable part of these problems have been solved directly in the work crew or line section. It is there that the most importance is attached to intensive factors, the use of which is possible without enlisting additional resources. However, this is possible only if there is a thorough understanding of their operating mechanism. This is where a substantial contribution is being made by the Belorussian branch of VNIPITS. In particular, it has developed (and USSR Gosstroy has approved) regulations on the official rights and obligations of such categories of engineering and technical personnel as foremen, work superintendents, senior work superintendents, norm-setters and assistant foremen. These regulations also stipulate the ordering of the organizational structure of line sections and a clear division of the functions of foremen and work superintendents, the boundary between which has become somewhat blurred in the last few years.

I would particularly like to mention the recommendations for determining the composition of work crews during the formulation of plans for the preparation of production work, which were developed by the same VNIPITS branch. These recommendations have affected the structure of the construction business at the very lowest level. We still have quite a few small work crews. However, practice has shown that large work crews operate considerably more efficiently. Why? The presence of such collectives makes it possible, above all, to improve controllability at the lowest level of construction production. It is no secret that a large number of small work crews leads to the dissipation of material, technical and personnel resources. The organization of two-shift work becomes more complicated. It is precisely because of this that much time is lost on the "coordination" of different work crews working on the first and second shifts. It is another matter altogether when full-blooded collectives led by well trained specialists are at work. Here the crew chief successfully coordinates the activities of all his units, organizes the supplying of the builders with designs and materials, and so forth.

Another matter of no little importance is that as work crews become larger, there is a great improvement in the conditions for mass political and educational work. There appears the possibility of creating Party and Komsomol groups as well as

professional groups, and this is a great organizing and mobilizing force. Communist Party and Komsomol members and trade union activists lead discussions at construction projects and pass on information about important events occurring in our country and abroad. They are the initiators of "lightning" output through praise and critical remarks. Thanks to them, labor competition among workers, units and work crews on construction projects is dealt with on an operational basis.

Along with economic science, we are giving unremitting attention to the development of technical progress in construction production. Tangible results have already been achieved. It is easy to recall how acute the urban development problem was in our republic! But now it is being solved, and at a rather high level. The scientists, planners and builders are all of inestimable value in this matter. Having combined their efforts, very experienced specialists from USSR Gosstroy's Central Scientific Research Institute of Experimental Planning of Housing, Belgosproyekt /Belorussian State Planning Institute/, Minskproyekt and other specialized organizations are in close contact with builders and are persistently and stubbornly looking for ways to develop industrial construction in the republic.

Particularly notable successes have been achieved in house building. It was only a short time ago that large-panel houses in Minsk differed little in outward appearance. They muted the architectural expressiveness of the city's neighborhoods. The planning decisions for apartments also left much to be desired. Therefore, the builders worked with the scientists and planners to improve the situation.

In 1968, the first 9-story apartment house of the new type was opened for occupancy in the Vostok-1 microrayon. A short time later, the builders of Minsk had all changed over to the erection of this type of residential building. At the same time, they began to create the production base for the manufacturing of designs for 14- and 16-story apartment buildings.

I wish to say this: The striving for height in present urban development practice is by no means an end in itself. On the contrary -- there, if I may say so, is an excellent embodiment of the unification of utility and beauty. Thanks to the creation of an extensive "palette" of sectional units of different heights, widths, configurations and esthetic solutions, there are now unlimited opportunities for designing residential structures with the most diversified outward appearances.

As a rule, the buildings now being erected face the main roads of cities and microrayons. They have built-in and added areas in which there are stores, cafes, communication centers and pharmacies. In a word, the expressiveness and plasticity of the buildings' facades meet completely the requirements of the present day. Much attention has also been given to improving planning and design decisions. Apartments now have higher ceilings, separate rooms, spacious halls and built-in furniture, while the interior trim is more esthetic and attractive. It is no accident that in recent years the state commissions that accept residential buildings from Minsk's builders have rated 9 out of 10 of them "good" or "excellent."

Such buildings now adorn the Belorussian capital in the microrayons of Serebryanka, Kurasovshchina, Yugo-Zapad, Masyukovshchina, Angarskaya, Serova, Zelenyy Lug-5, Zelenyy Lug-6 and others. However, if we talk about the effectiveness of large-panel residential construction for the most part, we automatically arrive at the following thought: in this respect, Minsk is no exception. There are now

high-capacity, productive house-building bases in many cities in our republic: Gomel' and Grodno, Vitebsk and Soligorsk, Brest and Mogilev, Bobruysk and Svetlogorsk. Here, also, the number of new homes in modern, multistory microrayons is growing every day.

At the same time, we have begun to build unique projects that are a source of professional pride for us. Not long ago, the covered pavilion of our capital's Central Market, with 1,200 shops, opened its doors to customers. This, in the full sense of the word, is a high-class structure. Creatively based on the achievements of modern science and technology, its plan was developed by a number of scientific research and planning establishments throughout the country, as well as specialists from the Belgiprotorg institute and the Minsk Scientific Research Institute of the Belorussian SSR's Ministry of the Construction Materials Industry. This plan has many distinctive features, the main one of which is the design of the roof. For the first time in either Soviet or foreign construction, a prefabricated monolithic shell of porous agglomerate concrete was used. This made it possible to reduce the weight of the load-bearing structures -- the framework and foundations, in particular -- by up to 20-25 percent. The absence of load-bearing columns inside the building made it possible to utilize the most rational planning decisions with flexible techniques for organizing the commercial end.

Active utilization of the achievements of science and technology helped our builders to erect and put to use many other unique projects both successfully and with a considerable economic effect. With good reason we can include among them the Mozyr' petroleum processing plant, the Mogilev silk fabric combine, the Molo-dechno light metal structures plant, the Zhlobin manmade fur plant and others.

It is characteristic that our scientists, in conjunction with practical workers, are moving boldly forward to the utilization of new and effective solutions. It is well known, for example, that the production of reinforced concrete designs using vibration techniques has long been clearly in conflict with the methods used to calculate and design articles made from high-strength concretes. Scientists from the Belorussian Polytechnical Institute's Department of Reinforced Concrete Designs, in conjunction with specialists from Orgtekhstroy /State Trust for Industrial Construction/ and a Belorussian SSR Minpromstroy branch laboratory that was set up at this VUZ, developed and introduced in a comparatively short period of time reinforced concrete columns with a circular cross-section that were produced by the centrifuging method. A technical and economic analysis of the construction of objects using these new articles demonstrated their great advantages over previous designs.

In this matter, one important factor is that centrifuging made it possible to obtain high-grade concrete. The cost of a single column is reduced by an average of 50-70 rubles. The labor required to produce the designs is reduced by 15-20 percent. Steel consumption has dropped by up to 35 percent, while for concrete the savings is up to 50 percent. The high quality of the outer surface of centrifuged columns means that they do not have to be finished at the construction site. The manufacturing process is mechanized and automated, vibration is completely eliminated, and the cost of transporting the columns has been cut in half.

Right now, centrifuged structures are being manufactured on two production lines at the Orsha reinforced concrete goods plant. In the future our ministry plans to build a modern plant for the production of centrifuged goods in Luninets.

Nevertheless, if we speak of the state of affairs on the whole, the builders have serious grounds for concern. At the 19th Plenum of the CC CP of Belorussia, it was emphasized that much -- indeed, very much -- remains to be done with the help of science so that the construction business can reach a qualitatively new level and overcome this branch's backwardness.

Consequently, we must expand and deepen our interaction with science more actively. The Minskstroy construction and installation production combine has long had an agreement on joint activity with two departments at the Belorussian Polytechnical Institute. Having proven to ourselves the great utility of this collaboration, we are looking for ways to expand it. The institute's scientists and the combine's specialists are working out the basic propositions of a long-term agreement that will unite science and construction production into a unified system that will struggle to achieve technical progress. In order to strengthen the institute's base and improve the quality of the implementation of the scientific research work stipulated by the economic agreement, the builders will give the necessary material and technical assistance to the appropriate laboratories and departments at the Institute. If it is necessary to do research directly in the construction organizations, the combine will offer those doing the work the temporary free use of space, facilities and equipment.

The basic goal of this association's activity will be to improve the system for training specialists, the joint conduct of scientific research work in different areas of our production work, and the introduction of the results of this work in construction organizations and the enterprises of the Minskstroy combine. Moreover, in connection with the combine it has been proposed that we set up the basic Belorussian Polytechnical Institute departments that will be staffed by highly qualified specialists from our branch.

Many useful things are being planned in the area of developing and improving construction production work. They include the development and improvement of the technology for erecting monolithic structures, searching for the proper composition for high-grade concretes, and investigating the properties of cement-polymer concretes with porous aggregates and designs based on them.

It is true that vast horizons are opening for the multithousand-member collective of the Minskstroy combine and the scientists from the Belorussian Polytechnical Institute. It may very well be that they will be the first to take an active part in the solution of our urgent problems. Incidentally, they have already done a great deal. They are the ones experimenting in new areas of the union of science with production.

In recent years there has been a significant strengthening of the builders' creative relationships with scientific research organizations and higher educational institutions in Belorussia and throughout the Soviet Union. We have expanded our joint activity with people from the most diversified professions. In this there is a great potential that will stand our builders in good stead. Nevertheless, despite the promising prospects, we cannot close our eyes to the serious shortcomings in the introduction of the results of scientific research in our production work and to the fact that the construction business does not always receive the needed return from science.

Through the fault of several institutes, at times we are forced to allow material outlays. It is not necessary to reach far for facts in this matter. As long ago as the beginning of the Ninth Five-Year Plan, the Belpromproyekt institute issued the documentation for the construction in Minsk of Large-Panel House-Building Plant No 3. In turn, for the first time in Soviet practice, USSR Gosstroy's Central Scientific Research Institute of Experimental Planning of Housing proposed that articles for houses be cast from hot concrete mixtures instead of cold ones. This, the specialists stated, should accelerate the production of articles by a minimum of 30 percent.

The builders energetically took upon themselves the task of realizing this innovation. The framework of a new plant appeared in 1975. Immediately, however, things began to slow down. The new method of casting parts turned out to be clearly unsuitable. As soon as the technological "thread" went into operation, the concrete mold units, assemblies and entire conveyor lines went out of commission. Alteration followed alteration, but unsuccessfully. The realization of the ideas of specialists from two institutes did not lead to the creation of the highly efficient "mechanism" that had been thought out, in principle, on a progressive basis.

Errors committed by the planners and scientists turned into major labor and monetary expenditures for our house builders. And, as strange as it may seem, no one is in any hurry to correct the gross miscalculations and bring the business that has been begun to its logical end.

Here is another serious mess. In 1975, the Belorussian SSR Gosstroy's Institute of Construction and Architecture (ISiA) suggested that the Minsk Production Association of Industrial House Building introduce an automated cassette-conveyor line for the production of inside wall panels. The house builders agreed willingly: According to the calculations of the Institute's specialists, production output volume should have increased by a factor of 1.5-2. There was supposed to be a significant increase in the strength of the articles and a reduction in the consumption of steel reinforcement and thermal energy. When the experimental line started operating, however, it turned out that many assemblies simply did not work. Numerous attempts to correct matters did not meet with success. Right now the work on improving the line is continuing, but expenses are also increasing. At the same time, an analogous situation occurred in connection with the creation of an installation for producing colored concrete from standard cements according to techniques proposed by the same ISiA.

We are encountering even more serious difficulties because we are poorly supplied with equipment featuring a low degree of mechanization. Actually, these days special prestige is enjoyed by that work where the percentage of manual labor is reduced to a minimum, where each section has modern equipment, and where not only muscle power, but also mental faculties are required on the part of a performer. However, the representatives of a whole series of construction professions have been deprived of this possibility. Unfortunately, the labor of roofers, finishers, concrete workers, and workers in several other specialties still remains difficult and not very productive.

The sharp criticism that was directed at us from the rostrum at the republic meeting of the Party-economic aktiv on 1 July 1980 was completely justified. They said that the builders are handling the mechanization of manual labor extremely poorly

and that this will inevitably lead to a reduction in the rate of increase of labor productivity.

We, of course, are not declining all the responsibility for these serious shortcomings. At the same time, we can make substantiated complaints against the supply agencies, which are filling our orders for low-mechanization equipment far from completely. Right now we have less than half of the amount of equipment needed. Here is what the numbers have to say. This year our organization ordered 95 machines for smoothing concrete subfloor foundations, but only 8 were produced. Instead of the 149 grinding and planing machines we requested, we received 10. We asked for 448 paint-spraying tanks and received 74. We were sent many less two-roller paint mills than we need. By the way, this pattern is repeated from quarter to quarter, from year to year.

We placed great hope in the Minsk branch of the USSR Ministry of Construction, Road and Municipal Machine Building's All-Union Scientific Research, Planning and Design Institute of Mechanized and Manual Construction-Installation Tools, Vibrators and Construction-Finishing Machines (VNIISMI), which was set up in this city in 1971. Our ministry, which is interested in this collective's fruitful activity, built for it a rather good experimental base and constructed administrative quarters. However, the builders have not yet received the needed return from the branch's scientists, designers and engineers. Most of the samples of low-mechanization equipment offered by the VNIISMI branch have substantial design flaws and do not produce the desired results.

When speaking of the shortcomings in the work of our compatriots, we are absolutely not closing our eyes to our own omissions. We have still not put all of our available reserves to use. Materials and materiel are not used economically everywhere. The organization of labor and discipline leaves much to be desired. The collective of the ministry and its party organization are faced with a great deal of work to eliminate these and other flaws. The Party's and government's decrees on improving the economic mechanism pose particularly serious problems for us. In fulfilling them, we and the scientists are called upon to improve production efficiency and the quality of the work in all our units. It is precisely in this area that science must offer us those solutions that would enable us to achieve a sharp increase in the rate of growth of labor productivity and reach a qualitatively new level. First of all, it is necessary to have a sharp (by at least 50 percent) reduction in the amount of time it takes to introduce scientific ideas and developments into construction production.

Our agreements with the scientists should take on a Statewide scope and scale. A mutual creative search is the only thing that will produce the required economic effect. Such a search can be developed and extended successfully only -- as practice has shown -- under the conditions provided by scientific production associations. For their creation we have at our disposal a large detachment of talented scientists, designers, engineers and technologists. Moreover, we have a comparatively good production base. The creation of associations will make it possible for science and production to close ranks and find the shortest paths to the introduction of developments in construction. All of this will enable us to lay strong foundations for the further strengthening of the technical and economic base for efficient work in the upcoming 11th Five-Year Plan.

CONSTRUCTION

DIRECTIVES ON HOME, PUBLIC CONSTRUCTION FOR 1981-1985

Moscow ZHILISHCHNOYE STROITEL'STVO in Russian Aug 80 pp 30-32

/"Directives on the Rational Structure of the Construction and Number of Stories of Residential and Public Buildings for 1981-1985"/

/Text/ 1. General Section

1.1. These Directives have been developed for the purpose of increasing the economic effectiveness of capital investments in residential and municipal construction and reducing the consumption of basic construction materials and the labor-intensiveness and cost of this construction.

1.2. The Directives are mandatory for use in all populated points throughout the country and must be used by USSR ministries and departments, Union Republic Gosplans and Gosstroy, Autonomous Republic Councils of Ministers and the executive committees of kray, oblast, rayon and city Councils of People's Deputies in the development of:

five-year and annual plans for residential and municipal construction and the development of its production base;

projects for the detailed planning and build-up of cities, settlements and rural populated points;

the planned structure of State residential construction, realized in accordance with the "Directives on the Order of Determining the Planned Structure of Residential Construction and Average Estimated Cost of One Square Meter of the Total Area of Residential Buildings for 1981-1985," as approved by USSR Gosplan's and USSR Gosstroy's Decree No 209/250 of 29 December 1979;

the planned structure of mass-construction public buildings -- children's preschool establishments, general education schools, hospitals and ambulatory-polyclinical establishments -- realized in accordance with the "Directives on the Order of Determining the Planned Structure of Construction and Average Estimated Cost of a Unit of Capacity of Buildings for Children's Preschool Establishments, General Education Schools, Hospitals and Ambulatory-Polyclinical Establishments for 1981-1985," as approved by USSR Gosplan's and USSR Gosstroy's Decree No 209/250 of 29 December 1979.

1.3. The determination of the rational structure for the construction and number of floors of residential and public buildings for 1981-1985 must be made on the basis of the capital investment volumes set in the plans for economic and social development and assignments for the introduction into use of residential and public

buildings that correspond to the calculated units of capacity or traffic capacity, with due consideration for the existing standardized periods for the duration of construction work.

1.4. When planning capital investments and developing plans for residential buildings, it is necessary to observe the Directives' requirements for the composition of costs and the order of their application to the estimated cost of residential construction (SN 6-71), as approved by USSR Gosstroy's Decree No 98 of 9 July 1971.

1.5. In the structure relating to the number of floors, the volume of construction of residential buildings of nine floors or more and multistory public buildings must be closely coordinated with the funds allocated for equipment by USSR and Union Republic ministries and departments; this applies, in particular, to passenger and freight-and-passenger elevators and special-purpose elevators.

1.6. The selection of the number of floors of residential buildings should be guided by the "Temporary Methodological Directives for Compiling Technical and Economic Substantiation for Selecting the Number of Floors of New Residential Construction in Cities," as approved by Gosgrazhdanstroy's /State Committee for Housing/ Order No 36 of 14 March 1972, as well as the SNiP /Construction Norms and Regulations/ chapter on planning and new construction in cities, settlements and rural populated points, as approved by USSR Gosstroy's Decree No 147 of 11 September 1975, with changes and supplements with respect to the number of floors in rural residences, as approved by USSR Gosstroy's Decree No 278 of 29 December 1978.

2. Residential Construction

2.1. Depending on the size of the city and local conditions, the most economical types of residential buildings for the mass build-up of cities and city-type settlements for 1981-1985 are 5- and 9-story apartment houses. For climatic subregions IA, IB, ID and IVA and areas at a height of at least 1,000 meters above sea level, the use of residential buildings without elevators of no more than 4 stories is permitted. In areas with 8- or 9-ball seismicity, four-story buildings should be primarily stipulated.

The use of nine-story residential buildings in mass residential construction is advisable:

in the capitals of the Union Republics and in large cities with populations of more than 500,000;

in large cities with populations of 250,000-500,000 where there are unfavorable geological engineering conditions (settling soil, flooded and peaty areas and so forth) requiring the implementation of complicated engineering and technical measures to prepare these areas for construction;

in the central regions of rebuilt and newly built large cities with populations of 250,000-500,000;

in cities with extremely limited possibilities for territorial expansion for the location of residential and municipal buildings.

In other cities and areas of cities where the construction conditions are not in those categories listed above, five-story buildings will be used in mass residential construction. In this case, in the period 1981-1985 the construction of nine-story residential buildings can be realized only with the necessary technical-economic and urban development substantiation.

2.2. In 1981-1985, the construction of residential buildings with 12-16 stories is allowed (except for Moscow, Leningrad and Kiev) in a limited volume, in the most critical sections of the housing system, with the appropriate urban development and technical-economic substantiation, in the largest, large and newly built cities, as well as in other cities in which, in accordance with the requirements of Paragraph 2.1 of these Directives, the feasibility of using 9-story residential buildings in mass residential construction has been determined.

In the construction of residential buildings with 12-16 stories in climatic regions I and II, the most economical multiapartment sectional units, with a total area of a typical floor in a section of at least 350 m² (6-8 apartments), should be used. For construction in these areas, the use of sectional units with a latitudinal orientation in 12-16-story buildings should be allowed only when there are special urban development reasons to be taken into consideration.

2.3. As a rule, residential buildings taller than 16 stories are not allowed, since they are not economical to build and operate and are less convenient for residence, in view of which the construction of such buildings can be permitted in each specific case only with permission from the Union Republic Council of Ministers, and in Moscow, Leningrad and Kiev, with the permission of the gorispolkom of the Council of People's Deputies.

2.4. The use in urban housing systems of single-section residences is allowed on the basis of architectural-compositional requirements when there is the appropriate urban development substantiation, as well as in cases where it is not possible to locate multisection residences, in particular in connection with selective construction for the purpose of increasing the density of the available housing, in crowded sections when residential areas are being rebuilt, in sections with complicated relief, in sections of limited size and more favorable soils in a framework of more complex geological engineering conditions in the construction area.

As a rule, the total area of apartments in single-section residences must not exceed 10 percent of the volume of the annual input of total area into a city's housing system, while the total area of a floor must be at least 300 m² for climatic regions I, II and III and 200 m² for climatic region IV.

2.5. The use of 1- and 2-story residential buildings in State and cooperative construction in small cities and city-type settlements is allowed, in the form of an exception, on plots of land that are specially stipulated for this type of construction and in those cases where the construction conditions make it impossible to erect taller buildings, and also when the construction of such residential buildings is provided for by decisions of the CC CPSU, USSR Council of Ministers and the Government of the USSR.

2.6. The use of 1-story residential buildings in State and cooperative construction is allowed, in the form of an exception, in mining and pioneer settlements during the first stage of the exploitation of mineral deposits, and also for line personnel engaged in the maintenance of electric power substations, railways, oil and gas pipeline traces, and in remote settlements belonging to lumber industry enterprises.

2.7. The construction in cities and city-type settlements of residential buildings with 3, 6, 7 and 8 stories, as well as 4-story residences (except for the

construction of these buildings in the regions listed in Paragraph 2.1 of these Directives), can be done only for the purpose of coordinating new parts of the housing system with existing units.

2.8. The selection of the number of floors in regions subject to seismic activity should be guided by the appropriate normative acts, including the "Directives for Construction Project Siting and Limiting the Number of Floors of Buildings in Seismic Regions," as approved by USSR Gosstroy's Decree No 145 of 26 August 1971.

2.9. In those cases where the number of floors and sectional nature of residential buildings stipulated in previously approved plans for the detailed planning and housing system of cities and rural populated points do not meet the requirements of these Directives, and where construction has not yet begun, the necessary changes must be made in the established order.

When such changes are introduced, the density of the available housing should be brought into accordance with the requirements of the SNIP chapter on the planning and housing system of cities, settlements and rural populated points, as approved by USSR Gosstroy's Decree No 147 of 11 September 1975, with the changes and supplements approved by USSR Gosstroy's Decree No 278 of 29 December 1978.

2.10. Construction of residential buildings that utilizes the facilities of State, public and cooperative organizations and that is done according to individual plans that violate the effective normative requirements for planning parameters and apartment areas and their separate locations, as well as with an increased consumption of metal, cement and other materials, is not allowed.

2.11. In residential construction carried out in rural populated points through the use of State capital investments and the facilities of residential construction co-operatives, the primary form of construction should be 1- and 2-story, 1- and 2-apartment residences of the farmhouse type and multiapartment block-type residential buildings, with a plot of land being allocated for each apartment.

Depending on the local conditions, it is permitted to use sectional residential buildings that are no more than 4 stories tall, along with the structures necessary for the conduct of private farming.

2.12. The construction of residential buildings must be carried out according to plan, with due consideration for the types of apartments needed for convenient and economical settlement, as well as the demographic structure of populated points.

2.13. As a rule, the construction of residential buildings of the framework and panel type is not allowed and can be done only as a means of depleting the equipment of frame-and-panel house-building enterprises, which should then be converted to the production of frameless residential buildings.

3. Construction of Public Buildings

3.1. The development of a rational structure for the construction of public buildings and structures (children's preschool establishments, general education and boarding schools, professional and technical establishments and secondary special educational institutions, stores and public dining enterprises, domestic services

facilities, hospitals and so on) should be guided by the CC CPSU and USSR Council of Ministers Decree No 392 of 28 May 1969, which stipulates that city housing must be located in strict accordance with the approved general plans for cities and the detailed plans for residential areas, on an integrated basis with all buildings for cultural and domestic purposes that are needed in order to create the appropriate working, living and leisure conditions for the workers, and should be based on the following principles:

the use of standard plans on the basis of the selection from existing lists of the ones that are most economical with respect to size (capacity), estimated cost of construction and operating expenses, as well as consumption of materials, with due consideration for the presence and proposed development of a construction base; the consolidation of cultural-domestic and municipal services institutions and enterprises and the placement of them in consolidated buildings and public commerce centers;

modernizations of the network of existing buildings by renovating and enlarging them and by replacing obsolete technical equipment;

allowing for the size of the population of a rural populated point, including the populace near this populated point, the purpose of the rural populated point (work crew settlement, central farm and so forth), and its position in the system for settlement when determining the composition and size (capacity) of establishments and enterprises for cultural-domestic and municipal services for the rural populace.

3.2. When planning public buildings, the choice of the number of floors must be made on the basis of technical and economic calculations originating from the requirements of the construction norms and regulations, the urban development value of the project being planned, and insuring convenience of personnel work and a rational level of operating expenses.

3.3. For the purpose of shortening the duration of the construction process, the construction of frame-and-panel and panel-type public buildings in volumes insuring the full utilization of the construction production base's capacities should be stipulated.

3.4. The optimum capacity of children's preschool establishments that are being built in cities, city-type settlements with populations of more than 10,000, and rural populated points with populations of more than 5,000, is (as a rule) taken to be 280-320 children, while in other settlements and rural populated points it is -- depending on their size -- 90-140. The construction of children's preschool establishment buildings with smaller capacities can be done only in individual cases, with the appropriate substantiation, on the basis of decisions of the executive committees of city and rayon Councils of People's Deputies.

Standard plans for general education schools with capacities of 1,176 or more (with an extended day) should be used in cities, city-type settlements with populations of at least 10,000 and rural populated points with populations of at least 5,000.

It is recommended that preschool establishments and general education schools be consolidated by renovating and enlarging existing buildings (annexes of premises for children's groups, classroom blocks, laboratories, reception rooms and so on).

3.5. The construction of hospitals, sanatoria, vacation homes, boarding houses and projects having to do with tourism must be performed on the basis of large

complexes by erecting new and enlarging and renovating existing complexes formed from separate buildings erected according to standard plans and, when the appropriate substantiation is present, on the basis of individual and repeatedly used economical plans.

3.6. The composition of the network of physical culture and sports structures must be determined independently of their departmental subordination and must include structures in microrayons and structures belonging to enterprises and establishments, as well as sporting societies.

The siting of complexes and separate structures in the planned structure of cities, settlements and rural populated points should be done in accordance with the directives for the planning of the network of physical culture and sports structures that have been approved by Gosgrazhdanstroy.

3.7. Retail trade, public dining and domestic services enterprises must be sited in accordance with the construction norms and regulations and the "Temporary Methodological Instructions for Compiling Prospective Plans for the Development and Siting of the Network of Commercial and Public Dining Enterprises (Within the Development of General City Plans)," as approved by the USSR Ministry of Trade's and Gosgrazhdanstroy's Order No 206/208 of 27 October 1972 and the "Temporary Instructions for Compiling Prospective Plans for the Development of the Network of Domestic Services Enterprises," as approved by Gosgrazhdanstroy's Order No 95 of 29 April 1976. The formulation of the structure must be oriented on the construction, as a rule, of trade and public centers, large free-standing buildings fitted with progressive technology and equipment, integrated public dining enterprises and Lifestyle Houses in combination with the network of reception points for domestic services enterprises.

In residential buildings located on main roads and in regions that are being rebuilt, it is possible to provide for integral or annex-type trade, public dining and domestic services enterprises, allowing for the requirements of the SNiP chapter on planning residential buildings.

In residential buildings, it is also allowed to locate cultural-domestic and municipal services establishments (savings banks, communication centers, libraries, housing operations offices and so on) in integral or annex-type premises.

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CONSTRUCTION

WAYS TO IMPROVE CONSTRUCTION PLANNING DISCUSSED

Moscow PRAVDA in Russian 11 Nov 80 p 2

[Article by A. Tokarev, USSR minister of Industrial Construction: "The Arsenal of a Steady Pace; Perfecting the Economic Mechanism"]

[Text] Our country achieved quite a number of successes during the years of the 10th Five-Year Plan. It will, as comrade L. I. Brezhnev said at the October (1980) Plenum of the CPSU Central Committee, occupy a place of merit in the history of our city's heroic deeds. The contribution of builders in these affairs is substantial. One of the most important sectors of the national economy is proving to have a great influence on the development of the economic structure and an improvement in the Soviet people's welfare.

The collectives of our ministry annually complete one-tenth of all construction and assembly work. Over the span of four years they erected more than 1,300 industrial structures and more than 40 million square meters of living space. More could have been done and it could have been done better. But, as has been noted many times, there are still many deficiencies in the sector. The level of labor and planning discipline is low, capital and resources are being overextended and the volumes of incomplete construction are growing. Is the collective in a position to overcome the sluggishness? Absolutely. And the 11th Five-Year Plan should become the turning point.

It is well known that in our country one-fifth of the national income is spent on construction annually. And it is very important to skillfully use such imposing funds and to better use each ruble. From this comes the strategic approach to the work of all participants in construction--to more quickly convert capital investments into usable funds. New ways of fundamentally improving affairs and of achieving good end results are outlined in the CPSU Central Committee and USSR Council of Ministers Decree concerning an improvement of the economic mechanism. This decree is oriented towards strengthening the role of the state plan. The rights of collectives are simultaneously being extended. Economic stimuli are directing them towards actively adopting new techniques, increasing labor productivity and improving quality. The main evaluation index is also being changed. Now the results of the work of construction and assembly organizations will be evaluated according to commodity production and structures which are put into operation. New horizons are being discovered for strengthening and developing this important sector of the economic structure.

The construction process chain is complex and has many links. And we have to work out such a management mechanism that will be capable of orienting the efforts of all of the participants toward putting structures and capacities into operation. Do we have the expertise that would allow us to transfer to new rails today? Yes, we do.

This is, most of all, the expertise of Belorussian builders. The method, which is being used here, is directly aimed at the final production result. The overall economic formula is this--a ministry on a cost accounting system. The principles of self-repayment and self-financing were laid as the foundation. The role of profits from structures which have been turned over was increased. And the bank considers only finished products when paying out wages while unfinished production is in the standardized total. The method calls for the transfer to full credit for construction. One feature is: the ministry's program is being formulated as the sum of the plans of all of its clients. Thus, a coordination of the indices at all management levels is achieved. The ability to distribute the volumes of work between the years has made it possible for republic builders to better ensure the technological sequence of production and to work at a steady pace. Essentially new relationships were formed between the ministry and state budget. For the first time in practice it has acted as a guarantor of ensuring payments to the budget based on the standard quota distribution of profit.

Though the purity of the experiment was in many ways not what it should have been the results are self-evident. The average annual growth in construction commodity production comprised more than 15 percent. It proved to be double the growth in the volume of construction and assembly work. There is a remarkable fact: the timeframes for erecting structures was reduced and with few exceptions they were turned over for use on time and one-fifth were ahead of schedule. The volume of incomplete construction reached the standard level. Our error consists of the fact that we have been wavering back and forth for too long. I think that if there was no sluggishness then the majority of construction collectives could have already armed themselves with the Belorussian expertise during the 10th Five-Year Plan.

What has to be done in order to adjust the economic mechanism more quickly? Now, when the program for the first year of the 11th Five-Year Plan has been made up it is apparent that the construction plan turned out to have flaws. The commodity plan was given to the general contractors yet, here again, the minister-clients have remained aloof from it. The unity of operations, thus, suffered damages. And this must be corrected, having put construction commodity production and equal legal responsibility by clients for putting structures into operation into the contract regulations.

When calculating gross production previously, builders did not suffer significant economic losses for not fulfilling their portion of the work. Now the losses will become much more painful. This is what they are, for example, in the calculations for one million rubles of commodity production which are not obtained in the Belorussian Ministry of Industrial Construction. It is deprived of about 80,000 rubles of profit, 20,000 rubles of economic incentive funds and more than 12,000 rubles in bonuses for putting structures into operation. In addition, the construction collective must pay approximately 25,000 rubles to the bank for credit. And the contract organization may recover no less than 7 to 8 percent of the sum of the losses from the client.

There is another question. How can favorable conditions be created for self-repayment? Builders' profits continually decrease. And it is not their fault. An increase in wholesale prices for materials, a change in transportation schemes, and an increase in the work on agricultural structures and in the volume of reconstruction brought on additional expenses. Yet estimated prices have not changed in ten years now. Expenditures, thus, are not compensated for and profitability decreases. Credit payments frequently exceed collectives' profits. How can this be? Experience shows that in order to ensure self-repayment a profitability of no less than 8 percent is required. It is important to adopt new estimated sector prices for this. There are none yet.

There are still considerable errors in planning. Tasks are still not coordinated with material and technological capabilities. For example, our ministry was given plans with rates of growth at 10 to 17 percent for the entire 10th Five-Year Plan. They were projected as being even higher for individual rayons--30 to 40 percent. Yet resources were annually allocated at the level of the funds for 1975. From this comes incompleting construction which for us exceeds the annual program. The plans, undoubtedly, should be tight, but at the same time also realistic. Unfortunately, USSR Gosplan does not always take into consideration such important conditions.

If the plan for the first year of the 11th Five-Year Plan is analyzed, then it is again not coordinated with resources. A large growth has been set--16.7 percent. Yet 1.3 million tons of cement, 350,000 tons of rolled metal, 214,000 tons of steel pipes, and more than half the number of ceramic and glazed tiles that are needed were not received for this program. Certainly, we have the capability of reducing this deficit by means of a more economical consumption of materials. Nonetheless a fundamental solution to this important problem is needed.

It would be best of all, in our view, to impose order. First of all, the number of structures that are simultaneously being built should be sharply reduced. This eliminates the overextension of resources. Secondly, the entire supply system through the territorial subdivisions of USSR Gosstb must be organized based on projects and estimates.

The Orlov system of two-year uninterrupted planning has proved itself to be an effective tool for improving the economic mechanism. It is now already used in 100 cities of our country. Its use has made it possible to regulate the construction of cities, and to organize the flow line erection of buildings at a steady pace. The uninterrupted plan has made it possible to concentrate resources in the hands of the ispolkoms of local soviets of people's deputies. Our ministry is completing 46 percent of the housing construction program by this method. The effect is substantial. The number of structures that are simultaneously being built was lowered by a factor of 1.3, the timeframe for erecting them was reduced by 15 to 20 percent, and the coefficient for the turnover of structures for use at a steady pace increased from 0.61 to 0.73.

What is needed to expand things more? Most of all the builders themselves should be more active and have a greater fighting spirit. I think that the union republic councils of ministers and the ispolkoms of the local soviets of people's deputies must be charged with continuing the work to concentrate capital with a single client.

We are awaiting the official forming of the legal statute for this method from USSR Gosplan. In other words, the legal system for the two-year uninterrupted planning of capital investments for scheduling and building housing and civil structures has to be established. We are adopting the Orlov "uninterrupted planning method" according to a long term overall special purpose program called "Production Line." The rough drafts for the upcoming five-year plans are such: to transfer about 12 more cities to this method of planning, to reduce construction time by 12 percent and increase the coefficient for putting housing into use at a steady pace to 0.8.

The expertise of the collectives at the Main Administration for Construction in the East Siberian Region may prove to be valuable under the new economic conditions. A system of total engineering preparations for construction was worked out and adopted here and has given good results. This subdivision went from lagging behind to one of the foremost ones in a short period of time. And, what is important is that it is coping excellently with the starting programs: over 4 years, 73 of the 78 capacities and structures were turned over on time and several were ahead of schedule. Of the remaining five the main administration was not at fault but the equipment suppliers. What is the essence of the Irkutsk economic mechanism? First of all, strict planning stability. Secondly, the concentration of resources at starting structures. Thirdly, the precise coordination of tasks and resources. The program of engineering preparations for production is worked out for a half year spaced out by quarters and months.

The special standard technological documents that are compiled for each structure are the heart of the Irkutsk system. Included in them are basic decisions concerning the technology of the work and lists of calculations of physical volumes and material and technological resources. Complete technology is conceived of as composing the construction and assembly work at a structure or stage. It is put together by the crew by strictly considering the sequence for conducting the work. When this is done the low level collectives are outfitted with standard sets of mechanisms, inventory and tools for a particular type of work. High labor productivity comes from this. Now the ministry has begun to create a unified system of engineering preparations for structures to be built on the basis of the expertise of the Irkutsk people.

The 10th Five-Year Plan is coming to a close. It did not prove to be easy for builders. We were repeatedly and justifiably criticized for the low rates of growth in production and for not fulfilling plans. One of the reasons for such a situation is that we are not adopting the expertise of innovators and the best economic methods very well or on a broad scale. Labor productivity is growing particularly slowly. What is the matter here? We often complain about the lack of means of mechanization. Yes, we need them more and more. But how can the existing technology be used? It stands idle almost one-fifth of the working time. Here is our potential. Here is where we need to turn our thrifty master's eye.

In passing, I would like to ask a question concerning the transfer of the planning functions for turning out products by the construction ministries to their subdepartmental enterprises. Now these collectives are "cranking it out." Yet the construction sites need a product mix. Arrhythmia is apparent. Many products are being manufactured but they cannot be put into use--they are not complete. We have accumulated almost 2 million cubic meters of precast reinforced concrete alone.

The 11th Five-Year Plan is a qualitatively new stage of growth for the sector. And all of us have to work quite a bit in order to bring capital construction to a forward position and to increase its efficiency and influence on the development of the country's economy. And there is much help in this--the expertise accumulated during the 10th Five-Year Plan.

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CONSTRUCTION

USE OF SUPERPLASTICIZERS IN CONCRETE DISCUSSED

Vilnius SOVETSKAYA LITVA in Russian 3 Oct 80 p 2

[Article by A. Didika, chief engineer at the "Orgtekhatroy" Trust: "Once Again About Superplasticizers"]

[Text] On 21 February 1980 an article--"Fluid Concrete"--was published in SOVETSKAYA LITVA under the heading: "Attention: An Interesting Experiment." In it they talked about the first experiments that used superplasticizers--synthetic polymeric substances that give concrete much fluidity. The Shyaulyay Interkolkhoz Construction Organization first began to use them in our republic on an industrial scale. The feasibility of manufacturing these substances at reinforced concrete components plants was emphasized in the article.

On 26 April 1980 SOVETSKAYA LITVA again returned to this question in the article "Barriers of Sluggishness on the Road to Developing the Production and Use of Superplasticizers in Construction." The Lithuanian Communist Party's Construction and Municipal Services Division, having noted the opportune timing of the newspaper's address, directed the attention of Gosstroy and the republic Ministry of Construction toward the necessity of accelerating the work to create the production technology and develop the manufacturing of superplasticizers.

What has been done since that time? Have the barriers of sluggishness been overcome on the road to using superplasticizers? The article that is published below answers these questions.

First of all, I would like to say that the publication in SOVETSKAYA LITVA attracted the attention of builders in many oblasts and cities of the country. During those several months which passed after the first report on superplasticizers in the newspaper the author of these lines had to consult with representatives from Kaluga, Tula, Leningrad, Kaliningrad and other areas regarding the technology of producing and using them. Our trust is also sharing its expertise with builders in the Moldavian SSR, where a small shop for turning out superplasticizers has already been formed at the Kishinev housing construction combine.

Much has been done in our republic as well. The production technology was developed, hundreds of experiments were conducted in the Orgtekhstroy Trust laboratories and fairly good results were produced. And recently an experimental shop at the "Litbytkhim" Production Association manufactured the first batch of superplasticizers. Everyone was convinced, first of all, of the simplicity of the technological process and, secondly, of the availability, with the exception of one component, of the necessary raw materials in the republic.

Concrete workers in the Vilnius ZhBK [Reinforced Concrete Components] Plant No 3 were the first to test the "Litbytkhim" product. The superplasticizer was used by them when manufacturing beam type "400"--thin heavily reinforced products. The advantages became apparent immediately. The operating time for the vibration tables was considerably reduced, the quality improved (cavities and pockets disappeared), and the concrete's strength increased. In addition, it became clear that the old metal forms were perfectly suitable to manufacture beams by using superplasticizers. The last condition is extremely important. The fact of the matter is that many predicted the necessity of substituting the forms with new ones which entails a large consumption of metal.

They are happy to lead from here. Thus, the Western Construction Administration, which is building the Ignalina atomic power plant, organized the production of superplasticizers at its own ZhBK plant. Administrators at the Vilnius large panel housing construction DSK [Housing Construction Combine] plant, the Kaunas ZhBK-3 plant and a number of other enterprises are planning to develop the production of these substances that are needed very much. For this they really need appropriate assistance on the part of the republic's Ministry of Construction and a reinforced concrete components trust.

Yet, all the same, the fundamental question--the production of superplasticizers in amounts that would satisfy the republic's needs--remains open. Such large volumes are simply not within the capabilities of the "Litbytkhim" enterprises--their capacities are swamped with turning out another no less important product and this association has been called upon to solve completely different problems as well. This means that the topic should be concerned with creating a new industry or reconstructing one of those that are already in existence to turn out superplasticizers which promise builders millions of rubles in savings. The extensive use of this advanced technology when manufacturing reinforced concrete components promises a sharp increase in the productivity and quality of labor. It should be hoped that on the threshold of the 11th Five-Year Plan the question of using superplasticizers will leave the trial and testing stage and that possibilities will be searched for in the republic to produce and use them on a massive scale.

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CONSTRUCTION

MERITS OF STEADY PRODUCTION DISCUSSED

Moscow MOSKOVSKAYA PRAVDA in Russian 30 Oct 80 p 1

[Article: "The Effect of a Steady Pace; Yesterday the Collective of the 'Moscow Construction Machinery' Division No 3 Fulfilled the Five-Year Plan for the Volume of Construction and Assembly Work"]

[Text] Right at the beginning of the current year, while discussing the draft of their socialist obligations, the workers at "Mosstroymekhanizatsiya" No 3 decided to announce their approach toward economizing machinery shifts and toward increasing the output of each piece of construction machinery. They outlined a program, each paragraph of which really expressed a master's concern about lowering the cost of construction, reducing its duration and increasing economic efficiency.

The five-year goal for the volume of construction and assembly work was scheduled to be met by 29 October and the annual goal by 27 December.

A. Slonimskiy, administrator of the trust, tells how these promises are being fulfilled.

All subdivisions of the trust--five mechanization administrations--without exception, worked steadily and profitably all year. This has made it possible to outline new, even greater limits in honor of the 26th CPSU Congress. On 29 October, as we had pledged, we completed the five-year plan for the total volume of work and we will fulfill the annual plan two days earlier than originally scheduled. We will complete about 5.5 million rubles of work in the time remaining until the end of the year. The goal for growth in labor productivity will be fulfilled not at 0.1 percent but at 0.5 percent.

During the current year we will complete the earth work much sooner than scheduled at the fruit and vegetable bases in Solntsevo and Biryulev, at the Moskvoretskiy fruit and vegetable base and for the second phase of the Semenov decorative fabric factory.

What made it possible to shrink the time?

First of all, our excavator operators transferred over to a full-fledged dual work shift. Secondly, the top notch equipment operators work only according to a sliding schedule which specifies the steady use of each piece of construction machinery for the duration of the entire week.

We went about forming a multi-shift crew sensibly. The traditional scheme which general construction workers follow certainly could have been applied as its basis, that is, go to work from 9 am to 5 pm and from 5 pm to 12 midnight. But let's be honest. Where and when have you seen a full-fledged second shift at a construction site? As a rule people go home at 8 in the evening. And it's not quite proper to blame them for equipment operators obtained the right to unite and "couple" shifts, to work 10 to 14 hours in succession. Not everyone can bear such a thing.

So we decided to separate the shifts. The first, as it was assigned, continues from 9 am to 5 pm. And if the equipment operators want to remain behind to work a little more than usual--please! The second shift begins at 8 or 9 pm, they "go out" into the night as a whole, and continues until the metro opens. Thus, we have two full-fledged shifts and work practically around the clock. The adoption of this seemingly insignificant innovation alone made it possible to increase the output of the most advanced construction machinery by a factor of approximately one and a half.

And here's something else about one innovation. When taking on personal socialist obligations, workers annually pledge to treat technology carefully, to do technical maintenance work on machinery on time and to reduce their repair time. All of this is needed and important. But each animated act requires constant perfection. Here is why our equipment operators began to conclude two party agreements with maintenance workers during the process of competing to fittingly greet the 26th CPSU Congress. The first party is obliged to take care of equipment during the process of operating it and not to "break" it, and the second--to do quick, high quality maintenance work on machinery. The overall goal is also specified in the agreement of cooperation: there should not be a single breakdown in technology between scheduled maintenance work and in return the number of shifts worked should be increased by 10 percent in comparison with the standard. This means that each tenth piece of machinery that the initiators of the cooperation have can be considered conditionally idle.

This innovation was extensively applied at all five of the trust's administrations. Must it be said that extending it to all municipal construction sites will have a much greater effect?

All of this gives us confidence that we will fulfill our obligations and honorably greet the 26th Party Congress and, carrying out the decisions of the October Plenum of the CPSU Central Committee, we will work steadily during the first year of the 11th Five-Year Plan.

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CONSTRUCTION

SUPPORT SECTOR FAILING AMUR RURAL BUILDERS WHO WORK UNDER NEW RATING SYSTEM

Moscow STROITEL'NAYA GAZETA in Russian 8 Aug 80 p 2

[Article by I. Bud'ko, chief of the Oblast Production Administration of Amursel'stroy (Rural Construction Trust of Amurskaya Oblast) (Blagoveshchensk): "The First Step Is Difficult"]

[Text] The collective of our administration transferred after the start of the year to operation under the new system: the results of the work are assessed not according to the total funds assimilated but according to commodity output. Now we do not take an advance for the execution of construction and installing work, and we make settlements after turnover of the completed structure.

Dispersion is a well-known feature of the rural construction project. Thus, last year 19 contracting elements of Amursel'stroy worked at 270 facilities, and the radius of action of the administration's PMK's (mobile mechanized columns) was from 5 to 120 km. This makes itself felt. Although we even cut uncompleted performance by 3 million rubles' worth, the standard was still exceeded by 17 percent.

This year, together with clients and financing organizations, we formulated a plan that accorded with the requirements of the well-known decree of the CPSU Central Committee and the USSR Council of Ministers about improving the economic mechanism. It calls, for example, for reducing the "nezavershenka" (uncompleted construction) by 5 million rubles' worth and increasing the number of facilities turned over.

A year and six months have passed. It is early to sum up the final results. However, something can be said about some things. We were not able to realize the plans fully. We encountered a number of difficulties which were well known even before. For example, it is not always possible to formulate a program for construction and installing work and for the introduction of facilities that is in accord with the available capacity. It is impossible, let's say, to recognize as valid even the fact that Stroybank's oblast office, without considering the opinion of the contractor and the client, required this year that funds be singled out for the completion of all facilities on which construction had started before 1980 and were to be put into operation according to the standards. In other words they wanted to solve in one year a task which had taken shape over decades....

Of course, it is tempting to untie this knot as quickly as possible. But with this approach some PMK's are deprived of a backlog of accomplished work, and unnecessary difficulties are created. Moreover, it is a fact that our program for

startups these days is more strenuous than ever before: we are erecting a Zhil [reinforced-concrete products plant] in Belogorsk, a base for mineral fertilizers in Arkhar, eight general-education schools, and many other large facilities.

As before, the main brake is the lack of balance of plans for contract work with the materials and equipment resources and the uneven workload on the capacity of our subunits. Systematic breakdowns of shipments of metal, tube, wood and cement, both as to volume and variety, aggravate the situation.

Therefore, we view with special hope that paragraph of the decree that speaks about stable and balanced five-year plans. Our experience in operating under the new conditions, even if it has not been so prolonged, indicates with precision that such a proportioning in tasks does not come about all by itself. It is necessary to prepare for it even today.

There are not enough quarried materials in the oblast, and we do not have "our own" supplier of them. Amurskaya Oblast river ports, which are employed in extracting these materials from riverbeds, do not bear responsibility for timeliness, precise volume of shipment, and the correspondence of the materials to the GOST's [State All-Union Standards]. In our view, these functions must be transferred to Amurstroymaterialy [Amurskaya Oblast Building-Materials Industry Association].

It is known that USSR Gosstab has been charged with completing in 1981 the conversion of construction projects to the comprehensive supply of materials through the territorial organs for material-technical supply. Today this provisioning is being conducted in accordance with the norms per 1 million rubles' worth of construction and installing work, not according to the dates of turnover of the jobs. Experience indicates that in order for the work to succeed under the new terms, construction organizations should obtain from the suppliers the necessary materials and equipment on the basis of contractual principles and on the established dates. There is as yet no appropriate document.

We are feeling especially severely this year the need for clients to make lists of within-site construction project titles available to us and to reduce the time taken to open financing. At times the organs concerned do not feel the proper responsibility toward this business.

Since January we have not received clients' advances to cover expenditures for unfinished work. At the same time, the allotment to construction organizations of the standard in-house working capital in the amount of up to 10 percent of the annual volume of operations done with their in-house forces, which the decree calls for, still has not been realized. Right away this has put the collective in a difficult financial position.

The decree calls for the inclusion in the capital construction program, beginning with the plan for 1981, only of those construction projects for which on 1 July of the year preceding the plan year there is approved design and budget-estimating documentation. We should have defended in March the supplies needed for next year. But in June not one client, and above all the main one--the agricultural production administration of the oblast ispolkom, had yet actually presented a draft of the plan.

In order to fulfill successfully the tasks that were called for by the decrees about improving the economic mechanism, broad explanatory work and a psychological reorientation of all participants of the construction process are necessary. But this work is being held back now because of the lack of a number of standards documents.

Thus, for example, until now there has been no approved standard-practices documentation in accordance with which we could determine the work indicators. At the end of last year USSR Gosplan and USSR Gosstroy approved by facility the norms for construction time and the carry-over backlog of work for the Eleventh Five-Year Plan, but we still have not received them.

And so the first step of the work has been taken under conditions that are different from the previous ones and unusual for us. It has not been simple. But we are convinced: the future is behind the management methods, so we will undertake the business more actively.

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CONSTRUCTION

MOST EFFICIENT WAYS TO HEAT LOW-RISE RURAL HOUSING SUGGESTED

Moscow STROITEL'NAYA GAZETA in Russian 4 Aug 80 p 3

[Article by E. Barnatskiy, chief of the Engineering-Equipment Administration of Gongrazhdanstroy (State Committee for Civic Construction and Architecture): "Heat for the Farmstead Home"]

[Text] Who does not know the Russian stove? About 15 million of them are being operated right now in villages of the Russian Federation alone. And each year up to 200,000 new ones--of the most varied design--are manufactured annually.

Why is it that the Russian stove enjoys such great demand by our population? First of all, because they are built out of handy local building materials. Second, the most diverse fuels are burned in them, including mixed fuels that have been procured by the owners. Moreover, such a furnace is a good heat storer.

But the Russian furnace also has deficiencies. The principal one is low fuel efficiency--it is no more than 30-40 percent. The level of heat comfort created with such heating does not completely meet sanitary and hygienic standards. Several such furnaces are required in order to warm a multiple-room house. Naturally, this requires no small amount of servicing.

Today hardly anyone needs convincing that, with the rise in the level of the utilities equipment for rural housing, the advantages of village life are becoming more attractive, and the existing specific difficulties are easier to overcome. No little must be done in this respect, because only one-tenth of the housing inventory of the country's rural settlements has as yet been provided with modern systems for heating and hot-water supply. The problem of a utilities buildup is becoming still more severe because of the development of rural construction combines that build large-panel housing and wooden large-panel housing.

About one-third of all the heat energy generated in the country for these purposes is expended on the heat supply of the housing inventory in the countryside. It should be considered here that, while the generation of one kilocalorie of heat at a TETs and in urban regional boilerhouses requires about 170 kg of standard fuel equivalent, the Russian stoves in the countryside require 200-260 kg for these purposes. Rural boilerhouses are equipped primarily with cast-iron hot-water boilers. When mixed fuel is burned, their efficiency is low--only about half of it is transformed into useful heat. And only in some large settlements of high buildup density are the higher-capacity, more economical boilerhouses with water heaters and steam boilers operating.

Centralized heat supply, which requires major capital investment, the laying of expensive heat grids and the organization of a special operating service will be developed still further, but mainly only for the central farmstead.

The trend toward industrialized methods in the construction mainly of wooden-panel farmstead housing requires new solutions, unlike the traditional ones, for complete utilities services. What way is there to reduce energy expenditures in heating this housing?

It is known that the outer walls of factory-made wooden-panel housing have adequately high thermal resistance, but at the same time the interior structure of this housing is low in thermal capacity. Consequently, the housing cools rapidly. Today the task lies in preserving a normal temperature throughout the day by adequate air exchange in the premises, with two stockings per day.

What needs to be done for this purpose? First of all, raise the quality of manufacture and erection of enclosure structure, expand the use of improved types of heat insulation materials, and reduce air drafts. In farmstead housing, the installation of individual thermal generators which, with minimum labor expenditure for servicing, will meet the needs of a rural family for heating and hot water is recommended. These will increase fuel efficiency by 15 percent or more and decrease atmospheric pollution.

Our industry is producing various thermal generators that are being used and will be used in the short term in rural and urban construction of few stories. These are small cast-iron hot-water boilers and domestic-heating equipment that operate on various types of fuel. Enterprises are also producing small boilers made of steel panels that operate on solid and gas fuel, as well as water heaters for the hot-water supply of apartments and buildings as consumer goods.

Improvement of thermal generator design is continuing, and analyses are being made for the use primarily of solid fuel, particularly of run-of-mine fast-burning graded coal. It is important to develop a furnace for prolonged burning. Specialists of USSR Ministry of Materials scientific-research organizations are solving this task now.

Specialists of many organizations are working on the solution of the heat-supply problem. TsNIIEP [Central Scientific-Research and Design Institute for Standard and Experimental Design] of Utilities Equipment, for example, has prepared for publication an illustrated catalog of engineering solutions for decentralized utilities-equipment systems for farmstead buildups. Various types of systems for heating systems, hot-water supply and food preparation are proposed. It is envisioned that food will be prepared, as a rule, on gas burners, and, in the long term, on electric hot plates.

New type rural housing needs heat generators of different productivities, one apparatus to be built for heating and for hot-water supply. Specialists of the Donetsk Science and Production Association Gazoapparat and of TsNIIEP for Utilities Equipment have been engaged in solving this problem. Test models that they have fabricated are undergoing tests. The work must be accelerated in order to begin industrial production of such units.

About fuel for the countryside. It is desirable that the supply of graded coal and of coal briquettes be organized. This should be reflected in the overall

structure of the country's fuel supply. For the creation of additional capacity for upgrading fuel is more effective for the national economy than the operation of an enormous volume of transport for hauling low-grade fuel. For example, an average of about 20,000 railroad gondolas and 20,000-25,000 motor vehicles are required daily for shipping fuel for rural housing.

It is necessary that solar energy also be used to heat housing and water. Experimental solar installations are being operated and are under construction in the Central Asian republics, in the Ukraine, in Dagestan, and even in suburbs of Moscow. These installations provide not only an actual saving of fuel, but they do not pollute the environment. The time apparently has come for experiments leading to wide practice of the use of solar energy. But for this purpose, detailed and budget-estimating documentation and organization for production of the equipment are needed.

A variety of problems and local peculiarities in supplying rural housing with heat has engendered a multitude of engineering solutions. A check of them in practice will help in choosing the more desirable of them. This will enable a saving of material, energy and energy resources and will help in fully satisfying the needs of rural workers.

11409

CSO: 1821

CONSTRUCTION

NEW SYSTEM FOR SUPPLYING CONSTRUCTION JOBS NOT FULLY IMPLEMENTED

Moscow PRAVDA in Russian 19 Oct 80 p 2

[Article by A. Starukhin (Voronezh-Tambov): "How Has the Million Been Supplied?"]

[Text] The system of supplying construction projects with material resources in accordance with the so-called "millionik" has been in operation for a long time. The amount of cement, metal, wood, roofing, and finishing and other materials that is required at a job per 1 million rubles of cost is computed on the basis of average standards. A handbook enables the resources to be distributed proportionally with the requirements of ministries and agencies that play the role of clients. In this sense it is truly a life-saving tool for supply organs. The "millioniks" are updated regularly, and attempts are made to see to it that they consider with maximum precision the demands of construction projects. But the years go by, and reserves appear for doing construction work more effectively and for reducing construction costs, and that also means for reducing the consumption of materials, outfitting articles and structure. Because of this, a system of absolutely precise accounting for the resources for each facility is required. Expressions that are not entirely flattering are being uttered now against the "millionik."

...It is the dyestuffs association Pigment, on the outskirts of Tambov. The enterprise is doubling its capacity, and Tambovkhimpromstroy (Trust for the Construction of Chemical Industry Enterprises in Tambovskaya Oblast) should assimilate 62 million rubles' worth of work in the next few years. Three production buildings have been started. Columns are being erected at one of them, and pile footings are being driven on the site of two neighboring buildings. Simultaneously, the area for the next facilities is being expanded. There is no choice of location, and the builders are filling in drying ponds, which have become obsolete, with soil, in order to use more rationally the land that has been allocated. They have to move and dump 50 million cubic meters of soil. Thus, for a year, single types of operations associated with the execution of the below-grade work have been predominant at the construction project. Does the "millionik" consider this situation?

"At this stage we need primarily reinforcements for making piles, and cement...", says Tambovkhimpromstroy manager V. Strel'nikov, in evaluating the situation that has been created. "The actual requirement for cement is 9,900 tons but, according to the average standards, 3,879 tons of it are released, and 1,080 fewer tons of metal are called for. Then the 'millionik' advances the trust more than 10,000 square meters of entirely unneeded glass and almost the same amount of facing tile."

The "millionik" presupposes that materials will be manipulated and redistributed locally to a certain extent: what is not required for one job can be sent to another. But there they released eight types of surpluses that did not find application. Alas, it is often impossible to set matters straight directly in construction subunits, especially in the small ones. A graphic example is that same Tambov territorial construction administration, one of whose subunits is the above-named trust. During the year it did 64 million rubles' worth of work, and Pigment is a facility unique in its nature and scope, and, in comparison with others, it is enormous. Help to the collective that is engaged here, with cement and metal at the expense of others would mean, practically, freezing them.

What should be done, what is the way out? It was found. What is more, the decree of the CPSU Central Committee and the Council of Ministers about improving the economic mechanism calls for the completion next year of the conversion of construction projects that are included in the state plan to the comprehensive supplying of materials in accordance with the requirements that are determined by the designs and budget estimates. The period allowed for restructuring is extremely short. The introduction of any serious innovation requires preliminary preparation. And the USSR Ministry of Construction knowingly ordered the Tambov administration to begin to supply Tambovkhimpromstroy in accordance with its actual requirements.

It would seem that a consistent system is being developed and that the Tambov builders will be able to breathe easily. But no. The territorial administration is being supplied according to the "millionik." And the redistribution of resources within its own subunits, as we have already said, is an impossibility. There remains one way out--to requisition material resources above the estimated requirements. But how is this to be done if the designs and budget-estimating documentation for facilities for the next year are issued to the builders in the best case by the start of July of the current year, and it is necessary to order the materials 2 months earlier. And so the oblast supervisor of construction projects was not able to carry out the ministry's order fully. What does this lead to?

Here is an example. Rod steel 18 mm in diameter arrived. The design calls for a 14-mm diameter. Because of this seemingly insignificant difference, a highly effective stand for welding reinforcement structure automatically was shut down. The rods had to be welded manually.

How can one get hold of the design and budget-estimating documentation in time? Giproprom [State Institute for the Design of Industrial Enterprises], which is located in Voronezh, prepares it for Tambov. We are conversing with institute director A. Levenberg.

"Minstroy [Ministry of Construction] has at its disposal all the designs for complete provisioning with material resources. The job is labor intensive. The staff workers that are engaged with estimates must be increased 1½-fold in order to cope with it."

It so happened that on that very day a section of the scientific and technical council of Soyuzstroyproekt [All-Union Association for the Construction Design of Industrial Enterprises, Buildings and Structures], based at the institute, was working along with many specialists from the country's republics and cities. Such a burning question as making designs and budget estimates available to the clients,

with instructions about the amounts of all types of materials, and, moreover, at the earliest dates, naturally attracts special attention. And the discussions themselves about the problems drew a picture far from joyful: very likely only Kazakh PromstroyNIiprojekt [Scientific-Research and Design Institute for Industrial Construction], where all the basic computations are made at a suitable technical level under a program specially prepared for computers, was able to share experience.

Several years ago, by way of experiment, a number of large construction organizations were converted to the provisioning of materials and equipment according to actual requirements. USSR Gosnab was directed to supply complete sets of equipment through the funds of the appropriate construction ministries. Let us note that Gosnab showed an interest in the experiment and undertook the matter energetically. An adequate period of time elapsed. How do matters stand today with just one of the organizations mentioned?

The first 2 years, Voronezh Territorial Administration supervisors recall, changes were felt in everything and supply improved. In accordance with the logic of things, further development of an experiment usually is accompanied by a careful refinement of all the components, improvement of the new way, and the achievement of maximum effectiveness. Here the reverse happened.

"The operating-equipment sections of the trusts and the outfitting administrations and the staff of each SMU [construction and installing administration] regularly did an enormous amount of work, figuring out in accordance with the documentation what materials were required for the various jobs," stated territorial administration chief G. Sukhomlinov with regret. "And it turned out that the work was in vain. At the start of the year, our subunits should have obtained 28,300 tons of metal, judging by the drawings and the budget estimates. Incidentally, this figure had been monitored and approved by the Central Chernozem Main Administration of Gosnab. However, we did not receive even 20,000 tons, because the allowance was approved all over again in accordance with the 'millionik' standards.

"We began to erect the Pridon Chemical Plant at Voronezh, and the construction project right away experienced a crisis because of the lack of rolled metal, since the 'millionik' was stingy in filling chemical-facility orders for metals. Work was being promoted at the vast Pavlov quarry, where tens of millions of rubles had to be assimilated basically in earthmoving work, but the quarry builders were being supplied unceasingly with metal for which they had no need. Perhaps, having received funds for material resources from the ministries in accordance with the terms of the experiment, and having become, in essence, the custodians of capital equipment, Gosnab organs were thereby freeing the builders of excessive bother? You will not say that today."

We conversed with F. Khromchenko, chief of the Supply Section for Construction Organizations of the Gosnab territorial main administration, when he had finished writing an official letter to a higher jurisdiction, trying for an allocation of another 6,000 tons of rolled metal. In the letter he sent, three main causes were named for today's deficit: the actual requirement for rolled metal for erection of the Pridon Chemical Plant exceeds the amounts released under the "millionik" by 1,557 tons, and under the designs and budget estimates for housing facilities 1,813 tons are lacking, and, for the same reason, more than 1,500 tons are lacking at the site for reconstruction of the heavy mechanical presses plant....

Apparently there was nothing at all special in the request that was posed, if the question is approached with the old criterion. However, does it not seem strange that the letter sets forth the request to open up supply in accordance with the design and budget-estimating documentation and that the letter emanates from a place where supply according to the drawings and estimates should have been accomplished for 10 years now!

What is at the root of these deviations, which are more than remarkable? The ministry, as we have already recalled, had been instructed to send Gosnab funds for resources for construction organizations that participate in the experiment. And, of course, they were sent. But in what volume, what amounts? They had already tried out the requirement for materials in accordance with the "millionik." As a consequence, Gosnab was required to release the materials in accordance...with the drawings and estimates. But the supply organs do not know where to find the resources to make up the difference in supplying complete sets of equipment. This is why, surely, Gosnab gradually cooled toward the experiment, and in any case can no longer be counted among its enthusiasts today.

But a cooling off is impermissible. For the further uplift of the level of planning and management, beginning with next year, faces builders with new, complicated tasks associated with the unfailing fulfillment of plans for introducing capacity into operation in accordance with construction commodity output.

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CONSTRUCTION

BELORUSSIANS URGE SYSTEM FOR ACCEPTANCE OF CONSTRUCTION JOBS BE REVISED

Minsk SOVETSKAYA BELORUSSIYA in Russian 10 Oct 80 p 2

[Article by F. Bobinskiy, chief engineer of Gosstroyinspektziya [State Construction Inspectorate] of BSSR [Belorussian SSR] Gosstroy, and A. Gorbachev, journalist: "2. Bonuses for...Unfinished Work"; passages enclosed in slantlines printed in boldface]

[Text] The headline of the article will, perhaps, cause perplexity to some people. Can such a thing really be possible? As we showed in the preceding article, "Who Sets the Evaluation and Who Is Evaluated," such a thing is not, unfortunately, rare in practice. State commissions, by virtue of a number of objective and subjective factors, frequently accept facilities with a large amount of unfinished work, which, incidentally, is not reflected in the acceptance papers.

/It would seem that the monitoring organs should intervene here. Stroybank, for example, has the right not to pay at all for housing or public buildings that have been erected but where work has been left undone. However, actually, this right is being used as a means of putting pressure on...the state commission. The builders, with the support of local organs, start to argue that it is not correct, they say, to refuse payment when the unfinished work consists of an insignificant part of the whole cost of the facility, that this cannot be allowed because it would put the building organization in a difficult economic situation. As a rule, the state commission does not withstand such a "friendly" onslaught and accepts the facility. And if it is impossible to accept housing and public-building facilities with unfinished work, then the reference to it is excluded from the acceptance document. As a result, Stroybank institutions formally lose their right to punish careless workers with the ruble, and all the construction participants receive full bonuses for introducing the facility./

In our view, it would be desirable, in the case of unfinished work on housing and public-building construction, to withhold the cost not of the whole facility and not of the unfinished work itself, but of an appropriate portion of the building so that the withheld sum would be enough to be appreciable to the contractors, but not ruinous, that is, a degree of punishment that corresponds to the degree of guilt.

After the introduction of settlements for completely finished facilities, Gosarkhstroykontrol' [State Architectural and Construction Control] organs lost the potential to influence construction and installing work quality by holding back payments

because of the unfinished work and defects. Formally, this can be done right now only after the housing is turned over for operation. However, it is practically impossible to apply penalties for the untimely elimination of deficiencies and defects after turnover of the housing, since, as was said above, the state acceptance commissions are compelled to testify officially to the absence of unfinished work or defects at any stage of the facility being accepted.

At present, construction legislation speaks only in general terms about the need to raise the responsibility of the state acceptance commission, and nowhere is the responsibility of the approving authorities set. And why should it not be established that the state commission bears full responsibility for the acceptance document's objective reflection of the state of the facility being accepted and the conclusions about the possibility of its acceptance for operation, and then the approving authority takes responsibility for the conclusion?

In any case, all complaints about the acceptance of a facility whose construction is not complete now are addressed to the state commission. Therefore, it is natural that the chairman of the state commission is not motivated toward the objectivity of the acceptance document: it is easier not to include the unfinished work in it.

/When the chairman of the state commission insists on observance of the established rule, he is often replaced by a more obliging one. Thus, in the urban-type settlement of Kirovsk, in Mogilevskaya Oblast, the deputy chairman of the rayon ispolkom--the chief of the UKS [Capital Construction Administration]--signed the state commission's document for acceptance of a department store instead of an "obstinate" rayon architect, who had objected to the acceptance. The rayon ispolkom approved this document, without the commission's presence. The Minsk city ispolkom approved two acceptance documents for the polyclinic for the Radiatornyy Street: one that reflected low-quality work--for the file on the job, the other a "clean" one--for presentation to Stroybank. A listing of such cases could be continued. If the chairman of the state commission bears personal responsibility for the document's objectivity and the approving authority is personally responsible for the approval of the conclusions, then the practitioners of such operations would be fewer./

I would like to call attention to another aspect of the matter. An overwhelming majority of facilities at which much work has not been finished are accepted for operation with a "good" evaluation. Again, no one answers for overpayment of the bonus.

/An attempt by Gosarkhstroykontrol' organs to reduce an evaluation to "satisfactory" was not sustained by Stroybank's Belkontora [Belorussian Office], since the acceptance document had already been prepared and no one had been given the right to change it. At the same time, Stroybank's Belkontora made it possible for gosarkhstroykontrol' to exclude the accepted facility altogether from the reporting, although the acceptance document had been approved. It turns out that it was possible to rescind the document that recognized that the facility was unsatisfactory, but it was not possible to reduce an evaluation to unsatisfactory./

In the recent past Stroybank's policy had been more exacting. In August 1976 USSR Stroybank established a procedure under which a penalty of 7 percent of the total cost was imposed on the contracting organization and the client for including poor-quality work in the reporting.

However, in November 1977 this decision was rescinded. Construction ministry managers, arguing their case for rescission, stated that Gosarkhstroykontrol' organs have the right to stop construction that is performed in violation of the norms and rules and to raise the question of calling the guilty persons to administrative and criminal account. It is well known, however, that administrative and criminal responsibility should not be put in confrontation with material and economic responsibility, that they should mutually complement each other. The suspension of construction and the calling of persons to criminal account--these comprise an extreme measure that is applied in exceptional circumstances, when there is a real threat to the stability of structures or when people's lives are threatened. Naturally, it is used rarely. As for the administrative responsibility of officials, this does not exclude the construction organization's economic responsibility, and the latter should be strengthened.

/Later on the construction ministries confirmed that "all uncompleted work permitted during the construction process has been eliminated by the construction organizations while the facility was being prepared for turnover for operation by the deadline established by the contract. The violation of these deadlines compels the contractor to pay penalizing sanctions." What deadlines are being talked about? The deadlines for eliminating the defects or the deadlines for turning the facility over for operation? If they are talking about deadlines for eliminating defects, are these not called for by the contract? If they are talking about the deadlines for turning the facility over for operation, then this talk is beside the point. The builders do protest sanctions for poor quality with references to fines for late turnover of the facility. Besides, it scarcely makes sense to start an exchange about the quality of work done long ago in most cases that are concealed by the fines, where the facility has been turned over for operation./

A penalty should be implemented only when it has educational value. The merit of a rescinded fine consists in the fact that it established the responsibility of the client for the acceptance of a defective product (the penalty is exacted from the client and contractor in equal parts). Nowadays, the client who pays for a defective product and is a confederate of the careless worker not only is not punished but is even encouraged, receiving his money back by decision of the control organs. The economic mechanism again operates against quality. In order that the client may reliably carry out the obligations vested in him, his responsibility for the acceptance of the defective product must be established.

/It is typical that USSR Stroybank, in its reply to BSSR Gosstroy's inquiry about the reasons for rescinding the fine, did not give its reason. Instead, it just quoted the construction ministry's arguments cited above. The impression is created that even Stroybank itself cannot justify the situation that has been created. And so a fine is imposed for inflated reports, and credit is cut off entirely for the lack of the journal that reports work done, while for the acceptance of a defective product alone, wage funds, credits and bonuses are revised. Actually, the acceptance of and payment for poor-quality construction and installing work are a greater evil than even inflated reports, since in this case more harm is inflicted on the state. With respect to deception of the state and selfish motives, these are involved both in exaggerated reports and in the acceptance of defective products./

Things have come to a head, and we are in complete accord here with the conclusions that are contained in the article, "Indulgence...Toward Careless Workers," by

M. Gerashechenko, chief of the RSFSR Gosstroy Board, which was published on 26 September of this year in PRAVDA, that standards documents should be reviewed in accordance with the instructions of the party and the government, and that precise criteria for evaluating quality should be established. And this must be done right now.

BSSR Gosstroy has undertaken the first steps in this direction. By a 1977 order it legalized unfinished work in housing and public-building construction, although this, strictly speaking, is not completely in accord with All-Union norms. However, this order still does not yield an appreciable benefit because of the resistance of local Stroybank organs. Proposals developed by BSSR Gosstroy about joint actions with Stroybank's Belkontora were acknowledged by the latter to be "deserving of attention" and were presented for examination by USSR Stroybank's Board. The matter ended there.

/TsSU [Central Statistical Administration] displays passivity and absolute neglect. In order to surmount the above-mentioned negative phenomena, the government has required BSSR TsSU to develop, jointly with the republic's Gosplan and Gosstroy, proposals for the introduction of accountability for construction quality. The BSSR Gosstroy proposals were examined at a meeting of representatives of the three agencies. In essence, there were no objections of any kind forthcoming at that time. However, BSSR TsSU then turned down the more important indicators, which were aimed at evaluating construction effectiveness with respect to the final results (generalized actual deadlines for assimilating the capacity introduced in comparison with the planned and standard periods, the actual amounts of uncompleted construction in comparison with the planned and standard amounts, and certain other indicators), without any explanation of its reasons./

Or let us take economic sanctions: it has been established, for example, that sanctions called for by law or by a contract are applied mandatorily, but the obligation to apply the sanctions in most cases is viewed only as a right. Even the control organs, when they discover contract violations, have not been "obligated," but only "have the right..." And why, in the excitement of the business, are fines and forfeitures not exacted at the initiative of Gosarbitrazh [state arbitration] on behalf of the state not only against the violators of the agreement but also against the victim? This would raise the exactingness of the contracting parties toward each other and would reduce cases of mutual pardoning for the harm done to each other, and, in the final analysis, to state interests. The use of economic sanctions should be converted from a "right" to an "obligation" of the control organs, particularly Gosarkhstroykontrol'.

The current organizational structure of state architectural and construction control does not help to improve construction quality. Since the chief of the UKS became a deputy chairman of the ispolkom, state control has become subordinated to the client, that is, to the one being monitored. Recently, it is true, most oblast ispolkoms formally have removed Gosarkhstroykontrol' from subordination to the UKS chief to subordination to the deputy chairman of the ispolkom. Only in Grodnenskaya Oblast was this not done. But even where such subordination formally has been abolished, the deputies of the ispolkom chairman--the chiefs of the UKS's have, it would stand to reason, greater influence than the Gosarkhstroykontrol' organs. Therefore, the Minskaya Oblast ispolkom has posed the question of transforming the Institute of Rayon Engineers of Gosarkhstroykontrol' into an inter-rayon inspectorate. However, this has not been decided, although the statistics

prove convincingly the effectiveness of the work of rayon Gosarkhstroykontrol' organs. It seems desirable to authorize the Minskaya Oblast ispolkom to conduct an experiment on creating grouped interr rayon Gosarkhstroykontrol' services that are subordinated directly to the oblast.

/The inadequate attention paid to construction product quality is explained by the fact that the reporting data about loss from defective work is being understated by many orders of magnitude. This occurs for various reasons: from a lack of motivation of construction organizations to display their inadequacies, and from the lack of a unified approach to the classification of expenditures and to monitoring the correct attribution of expenditures by articles consumed. The Ministry of Finance, which executes state control over effectiveness of the expenditures made in the national economy, faces, because of this, the task of working out measures to insure the completeness of reporting of defective work and of work done over in construction. Among such measures, it would be desirable to examine also the possibility of making good for the harm done by doing the work over, which is illegally attributed to other articles of expense, through the enterprise's funds./

Great possibilities for improving quality are concealed in improving the system for paying construction wages. The job-contract-plus-bonus wage rate and a differential system of wages, which are effective from this point of view, are scarcely being used.

Our various conclusions and recommendations are, it goes without saying, arguable, and require detailed, comprehensive review by the interested ministries, agencies and institutions. This is why, without pretending to completeness of analysis of the problems raised, we have striven to lay bare those obsolete propositions, without change of which it is impossible, in our view, to set up a reliable barrier against defective work in construction and to use all the advantages of the new management methods developed by the party and the government.

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CONSTRUCTION

BRIEF

HIGH STRENGTH STEEL--Kramatorsk--The first phase of an electroslag smelting complex is being put into operation at the "Novokramatorsk Machine Building Plant" Production Association. The electroslag method of smelting metal is an effective way of improving the quality of steel and especially crucial items that are made from it. Therefore, the Novokramatorsk workers attempted to start up the complex as soon as possible. And here it is in operation. The production area of its shops is 16,000 square meters. At present, two furnaces are in operation. The start-up of operations for the most powerful electroslag smelting furnace is next in line. The Khar'kov "Ukrigiprotyazhmash" worked out the design for the new complex. Metallurgists feel that the creators of this design were successful. Builders at the "Donmashstroy" trust and other organizations erected the complex. Much was done by the equipment manufacturers and suppliers and our collaborators at the Institute of Electric Welding imeni Paton actively assisted the Novokramatorsk workers. Many effective decisions came into being due to the creative cooperation of scientists, builders and operators which made it possible to accelerate the pace of construction for the structures of the complex. The large electroslag smelting furnaces make it possible to obtain metal ingots with a weight of 6 to 22 tons which are needed to manufacture rollers for rolling mills. Now, the Novokramatorsk plant will provide them to metallurgists at the Magnitogorsk, Zhdanov, Zaporozh'ye, Kommunarok, Makeyevka, and other enterprises. The new complex's high strength steel will also go towards manufacturing cast components for excavators, boring installations and machines that operate in the far North. Production at the new complex is being organized according to the principle of utilizing a production method which has no waste products. Rollers that are worn out and allowed to be smelted will be used as electrodes here. Special fluxes (slag) will also be repeatedly used--they are waste products from furnaces and will go into open hearth steel. A perfect scrubber system and a closed water supply circuit will be in operation at the plant. An installation for pressing together ingots, which will make it possible to increase their weight to 300 tons, will be erected next year together with the third electroslag smelting furnace. It will be possible to make the largest components from then including superpowerful rollers for the new "5000" plate mill. [Text] [Moscow IZVESTIYA in Russian 13 Nov 80 p 1] 9495

FOUNDATION MADE OF SPHERES--Frunze (TASS)--Even powerful earthquakes are not terrible for a building if it rests on a sphere. This was proved by the tests which were completed on the first housing unit in our country that has a foundation of so-called spherical supports. A powerful vibrating machine shook the building with varying frequencies and force imitating an underground storm with a force at a magnitude of 10. But it withstood it. This building was created by architects and housing builders in Frunze in collaboration with Moscow scientists of the Central NII [Scientific Research Institute] of Structural Building Components named V. A. Kucherenko. "Although such houses," said E. Eriklman, one of the authors of the design, "are intended to be built in zones where there are higher levels of seismic activity, their structural form is simple. The Frunze house, from the first floor to the roof, is a typical five-story building whose components are turned out in series at our DSK [Housing Construction Combine]. The heart of the innovation is in the foundation. It is as if it is almost cut into two parts which fit into each other by a 'dovetail' type wedge-shaped joint. Cast iron spheres sit between these parts, each bearing a load of more than 300 tons. The gap in the foundation is fastened by small beams made of fragile concrete--this is an original safety device. When there are strong underground jolts they are destroyed and the traveling spheres on which the building rests moderate and extinguish the jolts. After a jolt, the house, which shifted to one side or the other and even upwards (the structural form calculates this as well), smoothly returns to its spot." [Text] [Moscow IZVESTIYA in Russian 9 Oct 80 p 8] 9495

DEPARTMENTAL BARRIERS--Kuybyshev--Many construction organizations in the Kuybyshevskaya oblast are experiencing a shortage of precast reinforced concrete. Assemblers at a number of starting structures often stand idle due to a lack of structural components and pieces. At the same time the Zhigulevsk reinforced concrete products plant is only operating at half its capacity. It is capable of doubling its output of products without any kind of reconstruction. The equipment and personnel are available for this. And the reason is the following. The plant was built by the USSR Ministry of the Construction Materials Industry specifically to provide components and pieces to SMU-3 [Construction and Assembly Administration] in Zhigulevsk which is under the jurisdiction of the same ministry. It was intended for the SMU to develop into a trust which would have its own subdivisions in Kuybyshev, Tol'yatti, Ul'yanovsk, and other cities of Povolzh'. But the plans were not realized. The opposite happened. The volume of construction and assembly work decreased from year to year at SMU-3. Therefore, its need for precast reinforced concrete was reduced as well. And since it is a departmental plant the USSR Ministry of the Construction Materials Industry plans the production of components correspondingly. In order to somehow improve the use of equipment, the operational administrators of the enterprise are seeking clients on the side. But not all that are in need of reinforced concrete can use such a service. The plant is only capable of manufacturing structural components from compressed raw materials--cement and metal. "A way out of the 'vicious circle' is not hard to find," they say at the plant. There is an SMU in Kuybyshev that is under the jurisdiction of the RSFSR Ministry of the Construction Materials Industry. It has quite a bit of reinforced concrete components delivered from other rayons of the country. However, giving the load to the Zhigulevsk plant is impeded by a departmental barrier. Two ministries--the USSR and RSFSR Ministry of the Construction Materials Industry--are obligated to adopt a resolution on how to use the Zhigulevsk plant's capacity. [Text] [EKONOMICHESKAYA GAZETA in Russian No 41, October 1980 p 3] 9495

METALWORKING EQUIPMENT

NEW GENERATION OF ROBOTS DEVELOPED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Oct 80 p 2

[Article (TASS) (Kiev): "For All Sectors of Industry"]

[Text] A new generation of industrial robots is being developed by Soviet scientists and specialists. Unlike their predecessors which operate in a limited mode, these machines will be able to plan their actions automatically and implement many technological operations.

Prototypes of such models with unusual sense "organs" were demonstrated at the Second All-Union Inter-VUZ Scientific Technological Conference "Robots and Robot-Technical Systems" which concluded today in the Ukrainian capital.

"The CPSU Central Committee decree 'On measures for increasing production and the wide use of automatic manipulators in the industries of the national economy in the light of the 25th party congress' poses the problem of combining the development of electronic 'specialists' with updating production," stated Ye. Popov, corresponding member of the USSR Academy of Sciences and chairman of the Science Coordinating Council of the USSR Ministry of Higher and Specialized Education on the problem of "Robots and Robot-Technical Systems," in commenting on the work of the conference. As shown by experience, this approach of using robots in enterprises of the Vladimirskaya and Nikolayevskaya oblasts and the Krasnoyarskiy Kray made possible a radical improvement in the organization of labor, an increase, essentially, in the efficiency of production, and the main thing -- the freeing of thousands of people from hard and monotonous labor. By the assimilation of different functions and, in combination with all technological equipment of conveyors, sections and shops, the automatic machines provide, at the same time, for the modernization of the basic industrial sectors -- metallurgy, machine building, chemistry and transport.

The successful design of the new generation of robots -- "masters of all trades," will be facilitated greatly by new microprocessor equipment. The only remaining problem is to provide the electronic devices with mathematical algorithms that will make it possible for the robots to "think" in a real time scale and solve any problem rapidly.

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CSO: 1821

METALWORKING EQUIPMENT

AUTONOMY FOR INDUSTRIAL ROBOTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Nov 80 p 2

[Article by Ye. Popov, corresponding member of the USSR Academy of Sciences:
"Levels of Autonomy"]

[Text] The hands and muscular strength of man began to be replaced a long time ago by machines, devices and machine tools. Robots represent a qualitatively new step in mechanization and automation. In the final account, this means entrusting automatic robots not only with the muscular, but also the informational side of human activity. As is well known, this human activity depends on such qualities as the ability to sense the environment, compare, analyze and evaluate facts, make decisions and find ways to implement them.

To what extent do industrial robots need these qualities? The answer depends to a great extent on what we expect from their wide application. If we are to base this on the problems posed by the recent decree of the CPSU Central Committee, we are speaking not only of freeing millions of people from hard and monotonous manual labor, but also simultaneously raising modern production to a higher level.

Regrettably, for today's first generation robots, this role of increasing the efficiency of production still lies in the future. Being governed by a rigid control program, they frequently become fully incompetent at the least change in the working situation. Say, the machine tool robot will be unaffected if no intermediate product to be machined is found at a given point in space -- obeying the program, it will grab at the air with its "hands" and attempt to complete the operation. In the same way, first generation robots are incapable of taking a part from a moving conveyor belt, or selecting the necessary part from among several different ones.

Of course, first generation robots will also be used in the future. But along with them, the so-called second generation of robots will be widely used in the very near future. They will be capable of adapting automatically to a changeable and vaguely defined production situation. For this purpose, such adaptive robots are equipped with devices equivalent, to a certain extent, to sensory organs of humans -- technical sight, tactile sensors and other means of sensing the working medium.

Second generation adaptive robots are being developed in many organizations and part of them are undergoing experimental tests, including some under actual production conditions. But the extent of the work in this important direction can

hardly be called sufficient either in the scales of investigations and developments, or with respect to the creation of a technical base for their realization.

In particular, our industry practically does not produce sensors and devices that would make it possible for a robot to sense the surrounding situation. Yet, without them as a source of primary data, there cannot be adaptive control. We are not talking merely about tactile, force-torque, sight or ultrasonic sensing elements -- they must be equipped also with corresponding converters for introducing the data into controlling devices. They must be precise, reliable and small so that several such sensors can be placed in the "fingers" or "wrists" of the manipulator. The organization of the production of such devices is an important problem for the Minelektrotekhprom [Ministry of Electrical Equipment Industry], the Minpribor [Ministry of Instrument Making, Automation Equipment and Control Systems] and the Minelektroprom [Ministry of Electronics Industry]. Equally, research in the area of adaptive robots must be most intensive in the program of scientific research and planning-design work on robot equipment which, according to the CPSU Central Committee's decree, is being developed by the USSR State Committee on Science and Technology.

In the future, the development of adaptive control systems must lead to the appearance of a third generation of robots -- the so-called robots with "artificial intellect." This term frequently evokes objections: to many it appears far-fetched and remote from the practical problems faced by robot equipment. Therefore, it is necessary here to clarify immediately that we are not speaking at all about copying the properties of human consciousness.

By the way, no matter what the third generation robots are called, it is difficult to overestimate their advantages. Equipped with a developed system of sensors and devices for sensing the surrounding situation, we will be able to build into their "brains" (control computer) a simplified model of the situation, compare this model to the problem posed before it, work out problems about its actions in a given situation, plan them and give corresponding instructions for implementation by its manipulators. In other words, such robots will have a hierarchic control system of feedback that provides them with a high autonomy of action.

The last quality is of special importance. Among the problems faced by robot equipment, one of the most important is eliminating people in production facilities subject to radiation, high gas content, high and low temperatures and pressures. Primarily, we are talking about metallurgical, foundry and electroplating shops; the nuclear industry and power enterprises; underground mining; oil fields; and submarine work. It is precisely here that robots with high autonomy of action will be required.

Yet it is still quite a distance to the development of the third generation of robots. But this does not relieve us from the responsibility for solving the posed problem by all available means. In particular, instead of a fully automatic robot working under harmful production conditions, robots remotely controlled can be used. But they must be better qualitatively than the systems with copying manipulators which are used today.

The latter, as is well known, operates on the principle of direct repetition of the motion of an operator who is located at a safe distance away. However, although such systems do not require great physical effort, the operator's labor remains manual, intensive and tiring. It is entirely different with remote control robots. To ease the labor of the human operator, all operations that such a robot must perform are previously programmed and stored in the memory of the controlling device. The operator's duties are basically reduced to connecting these programs as needed, using one of three types of control: supervisory, semiautomatic or dialog.

Supervisory control consists of having the human operator, by means of a remote observation system, evaluate the situation and behavior of the robot and, from his control panel, introduce the necessary corrections. Semiautomatic control is used in cases where situations not provided for in any of the programs occur, or the operator sees that the robot is not coping with the posed problem -- in that situation the operator himself must take over control of the robot.

In time, perfect dialog control which is based on the interaction between the operator and the electronic "brain" of the robot will become possible. The latter, on the instruction of the operator, may itself propose its evaluation of the situation and a plan for further action in this situation. The operator either approves these suggestions or corrects them. The robot, in turn, may protest the received instruction if its implementation is dangerous to it for some reason. Then, on the basis of a dialog, a more correct solution is worked out.

The development and the wide introduction of robots with remote control involve the solutions of the same problems as those of automatically acting manipulators. However, in addition, here there originates a number of problems involving the necessity of remote observation and control. These problems must be solved by taking into account the specifics of those sectors of the national economy where remotely controlled robots will be used. They must be solved without delay.

Comrade Leonid Il'ich Brezhnev, speaking at the October (1980) Plenum of the CPSU Control Committee, stressed that "the tie between science and production, the effect of progressive ideas on it, is transmitted practically through machines and technology." Hardly anyone will question today the progressiveness of the industrial robot idea. Therefore, our common problem is to incorporate it in new machines and in the technological processes created on the basis of these new machines.

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METALWORKING EQUIPMENT

USE OF ROBOTS IN KRASHOYARSKIY KRAY

Moscow EKONOMICHESKAYA GAZETA in Russian No 45, Nov 80 p 15

[Article by G. Pashkov, manager of the Industrial Department of the Krasnoyarsk CPSU Kraykom: "The Siberian Robot"]

[Text] A certain amount of experience in organizing the production and introduction of automatic manipulators has been accumulated at the Krasnoyarskiy Kray. Further development of work in this direction will facilitate an increase in the productivity of labor and the solution of the labor resource problem in the 11th and 12th Five-Year Plan periods.

The collective of the "Kras mash" Plant was one of the first in our kray to pursue comprehensive mechanization and automation of production thoroughly by using industrial robots. They are being used successfully in shops where "Biryus" refrigerators are made. Here, for example, there are over ten automatic "painters." They operate in two shifts, providing the full annual requirements in painted sets of refrigerator housings and doors.

"Mechanical hands" are used to weld external boxes, and to transfer parts from conveyor to conveyor. Each automatic manipulator replaced the labor of no less than two workers and performs the most cumbersome and monotonous operations.

At the "Kras mash," the Department of Mechanization and Automation directs work in the area of robot equipment. Its specialists study the possibilities of using robots; recommend the acquisition of manipulators manufactured at enterprises of other industrial sectors; and themselves do design work. The plant has a mechanization and automation shop where industrial robots are made.

Jointly with the technological institute of the industrial sector, a program for comprehensive mechanization and automation was prepared for the 11th Five-Year Plan period. The creation of sections equipped with automated manipulators was selected as the basic direction. For example, TRT-1-250 transportation robots for moving parts will become a component part of the automated transport-warehousing complex (ATSK). In the next five-year plan period, it was decided to improve the operation of the robot equipment already available. In particular, it is planned to establish a centralized servicing of these devices.

Other large kray enterprises are purposefully and systematically involved with robots. These are the production associations "Minusinskiy Electrotechnical Production Complex," the "Abakanvagonmash" and the Krasnoyarsk Television Plant.

In the "Sibtsvetmetavtomatika" Scientific Production Association, original apparatus were tested in the early sixties for radio control of cultivating bulldozers. Now it is investigating the possibility of using industrial robots at nonferrous metallurgy enterprises. Prospects are being studied of using a self-propelled caterpillar manipulator with a pneumohydraulic striker to work veins of ore deposits by new technology, as well as systems for the automatic control of materials handling machines.

The CPSU Kray Committee set a goal of coordinating scientific technological and engineering developments, organizing the correlation and dissemination of advanced experience in developing and introducing manipulators. These functions are being implemented at present by the Technical-Economic Council of the CPSU Kraykom. It contains a group working on robots. The methodological guidance is entrusted to the Sector of Regional Problems of the Scientific Technological Progress of the Economics and Industrial Production Organization Siberian Affiliate of the USSR Academy of Sciences and the "Sibtsvetmetavtomatika" NPT [Scientific Production Association].

The working group prepared the "Sibirskiy robot" interindustrial program which calls for the introduction, in the future, of about 1000 industrial robots in the Krasnoyarskiy Kray. At present specialists, in the light of the CPSU Central Committee on automatic manipulators, are preparing a proposal on organizing manipulators in the Kray on the basis of production cooperation between enterprises. The industrial departments of the party kraykom are participating in this actively.

To a great extent, success in using robots depends on the technical maturity and preparedness of the specialists in the area of production and operation of automatic manipulators. Top attention is being given to training engineers and technicians. In organizing training, the following moments stand out. First, specialists are called upon to master the necessary knowledge at the initial introduction stage. Secondly, the appearance of new equipment in the shops must be preceded by a thorough grounding in all problems of a technological and design nature.

Practical-scientific seminars on robots are becoming traditional in the kray. An especially useful seminar was held at the end of last year. Specialists from the kray's enterprises, scientists and specialists from Moscow, Leningrad, Kiev, Novosibirsk, Irkutsk and Magnitogorsk participated. In accordance with the seminar's recommendation, a Kray Interindustrial Scientific Technological Progress University with a Department of Comprehensive Mechanization and Automation Using Robots has been operating since the start of the current year. Its first auditors were deputy chief engineers and chief specialists from over 30 enterprises. Noted scientists from various cities in the country were invited to give lectures, and specialists of the Kray center gave lectures on local experience. The training is done during time taken off from work. At the end of the training course, the auditors presented papers.

With all its undoubted advantages, this form of training, obviously, cannot replace centralized training and retraining of cadres in the system of the USSR Ministry of Higher Education and Specialized Secondary Education. In our opinion, it needs improvement. The organization of all forms of training is complicated by the acute shortage of literature on automatic manipulators.

Robot development is an interindustrial problem. It is quite obvious that scientific research institutes and design bureaus of a number of ministries must participate in close cooperation in developing and accelerating production of industrial robots. It is important to single out the head organizations among them which have the proper rights. This will make it possible to pursue a single technical policy.

We are particularly disturbed by problems of a regional nature. Even those industries that produce and introduce automatic manipulators systematically give too little attention to the technical development of enterprises located in Siberia. Yet the efficiency of mechanization, automation and the reduction in manual labor is high even here.

Computations show that the introduction of robots at Krasnoyarskiy Kray enterprises will save tens of millions of rubles. The social effect is also considerable under Siberian conditions. In our opinion, first of all, it is necessary to equip enterprises of nonferrous and ferrous metallurgy, mining and lumbering with automatic manipulators.

Further mechanization and automation of production by using industrial robots is a new stage in a comprehensive approach to raising the productivity of labor.

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